

MAIWALD GMBH

PCT/EP97/03187

GSF/BAYER AG

[Stamped]: Amended Sheets

July 1, 1998

NEW CLAIMS 1-37

Plant DNA sequence:

ACTTTTCGAG CCCCTTGAAC TGGAAATTAA TACATTTTCC ACTTGACTT
TGAAAAGGAG GCAATCCCAC GGGAGGGAAG CTGCTACCAA CCTTCGTAAT
GTTAATGAAA TCAAAGTCAC TCAATGTCCG AATTTCAAAC CTCANCAACC
CAATAGCCAA T.

2. DNA sequence, as set forth in Claim 1, which originates from grapevine (Vitis vinifera).

3. DNA sequence, as set forth ^{in Claim 1} ~~in Claims 1 or 2~~ which is naturally contained in the stilbene-synthase gene Vst1 and corresponds to base pairs -270 to -430.

4. DNA-sequence which in relation to the DNA-sequence, as set forth ^{in Claim 1} ~~in one of Claims 1-3~~, has a sequence identity of at least 40%, especially of at least 60%, and which can convey an ozone-inducible gene expression, or which is a derivative or an allelic variant of the DNA-sequence set forth ^{in Claim 1} ~~in one of Claims 1-3~~, and which differs from said sequence by naturally occurring or artificially introduced variations, such as deletions, insertions, substitutions, additions, recombinations, and which is able to convey an ozone-inducible gene expression.

5. Promotor region of the stilbene-synthase gene Vst1 from grapevine which lacks at least the DNA-sequence, as set forth in Claim 1, with the exception of a promotor region which only consists of the 3' base pairs from base pair -140 or from base pair -40, and which is present in fusion with the reporter gene β -

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glucuronidase from E. coli.

6. Promotor region, as set forth in Claim 5, which comprises only the sequence range from the start of the translation to base pair -270.

- A 7. Promotor region, as set forth ^{in Claim 5} in Claims 5 or 6, which still conveys a pathogen-induced gene expression in plant cells.

- Sub C3 A 8. Chimeric nucleic-acid molecules into which has been inserted a DNA-sequence, as set forth ^{in Claim 1} in one of Claims 1 to 4, or at least a fragment thereof which can convey an ozone-inducible gene expression, with the exception of nucleic acid molecules that comprise the Vst1 promotor region occurring naturally in the Vst1-promotor 3' of the sequence, set forth in Claim 1, as well as said sequence.

9. Chimeric nucleic molecules, as set forth in Claim 8, which render possible an ozone-inducible expression of the coding regions in plants contained in said molecules.

10. Vectors which contain the DNA-sequence, a promotor region or a chimeric nucleic molecule, as set forth in ^{claim 1} one of the preceding claims, or fragments thereof.

- A 11. Transgenic plants which contain the DNA-sequence, a promotor region or a chimeric-acid molecule, as set forth in ^{claim 1} one of the preceding claims, as well as constituents of such plants and the propagation material thereof, such as protoplasts, plant cells, calli, seeds, tubers or cuttings, etc., as well as the offspring of such plants.

12. Transgenic plants which, due to the absence (present in the natural state) DNA-sequence
ACTTTCGAG CCCCTTGAAC TGGAAATTAA TACATTTTCC
ACTTGACTT TGAAAAGGAG GCAATCCCAC GGGAGGGAAG CTGCTACCAA
CCTTCGTAAT GTTAATGAAA TCAAAGTCAC TCAATGTCCG AATTTC AAC

CTCANCAACC CAATAGCCAA T, or due to the lack of at least one fragment thereof no longer show an ozone-inducible expression of the naturally ozone-inducible gene.

13. Plants, as set forth in Claim 12, in which the ozone-inducible expression of disease-resistant genes is greatly reduced.

- A 14. Plants, as set forth ^{in Claim 12} ~~in Claims 12 or 13~~, in which the ozone-inducible expression of stilbene-synthase genes, particularly that of the Vst1-gene from grapevine is greatly reduced.

- Sub C4*
A 15. Plants, as set forth in Claim 11, in which, ~~due to the introduction of the DNA-sequence, as set forth in one of Claims 1 to 4, or at least a fragment thereof,~~ an ozone-inducible gene expression of a gene in which said DNA sequence does not naturally occur, can take place.

16. Plants, as set forth in Claim 15, in which an ozone-inducible expression of those genes can take place, whose gene products in plant cells are able to detoxify reactive oxygen species.

- Sub C5*
A 17. Plants, as set forth ^{in Claim 15} ~~in Claims 15 or 16~~, in which an ozone-inducible expression of catalase or superoxide-dismutase genes can occur.

18. Plants, as set forth in Claim 15, in which an ozone-inducible expression of reporter genes can occur.

- A 19. Dicotyle plants, ^{as set forth in claim 11} ~~as set forth in one of Claims 11 to 18~~, in particular useful plants, such as soya bean, rape, tomato, sugar beet, potato, cotton, tobacco, as well as ornamental plants or trees.

A 20. Monocotyle plants, as set forth ^{in claim 11} ~~in one of Claim Nos. 11 to 18~~, especially grain such as oat, wheat, rye, barley, rice, millet or corn.

A 21. Transgenic plant cells, including protoplasts, which contain the DNA-sequence, ^{in claim 1} a promotor region or a chimeric nucleic-acid molecule, as set forth ~~in one of Claim Nos. 1 to 10.~~

22. Plant cells, including protoplasts, which, due to the absence (present in the natural state) of the DNA sequence
ACTTTTCGAG CCCCTTGAAC TGGAAATTAA TACATTTTCC ACTTGACTTT
TGAAAAGGAG GGAATCCCAC GGGAGGGAAG CTGCTACCAA
CCTTCGTAAT GTTAATGAAA TCAAAGTCAC TCAATGTCCG AATTTCAAAC
CTCANCAACC CAATAGCCAA T,
or due to a lack of at least one fragment thereof, no longer show an ozone-inducible expression of the naturally ozone-inducible gene.

A 23. Plant cells, as set forth in Claim 21, in which, ~~due to the introduction of the DNA-sequence, as set forth in one of Claims 1 to 4, or at least a fragment thereof,~~ an ozone-inducible gene expression of a gene in which said DNA sequence does not naturally occur, can take place.

A 24. Methods for producing transgenic plants or plant cells in which the ozone-inducible expression of naturally one-inducible, defensive genes is greatly reduced or eliminated by deleting the DNA-sequence, as set forth ^{in claim 1} ~~in one of Claims 1 to 4,~~ or at least a fragment thereof in the defensive gene which naturally contains said DNA sequence.

25. Processes, as set forth in Claim 24, in which the ozone-inducible expression of stilbene genes is greatly reduced or eliminated.

A 26. Processes, ^{in claim 24} as set forth ⁱⁿ ~~in Claims 24 or 25~~, in which the ozone-inducible expression of the Vst1-gene from grapevine is greatly reduced or eliminated.

Sub C7
A 27. ~~Methods for the production of transgenic plants or plant cells in which one or several genes, the expression of which is not naturally or not substantially induced by ozone, are ozone-inducible, due to the introduction of the DNA sequence, as set forth ^{in claim 1} in one of Claims 1 to 4, or a fragment thereof.~~

28. Methods, as set forth in Claim 27, in which one or several catalase and/or superoxide-dismutase genes are ozone-inducible.

29. Processes, as set forth in Claim 27 in which one or several reporter genes are ozone-inducible.

Sub C7
A 30. ~~Methods for removing the ozone-inducibility of naturally ozone-inducible defensive genes which naturally contain the DNA-sequence, as set forth ^{in claim 1} in one of Claims 1 to 4, by deleting or inactivating the DNA sequence, as set forth ⁱⁿ in one of Claims 1 to 4, or at least a fragment thereof.~~

A 31. A process, as set forth in Claim 30, in which the gene is a stilbene-synthase gene.

A 32. ^{in Claim 30} A process, as set forth ⁱⁿ ~~in Claims 30 or 31~~, in which the gene is the Vst1-gene from grapevine.

Sub C7
A 33. ~~A method for producing ozone-inducible characteristics in transgenic plants or plant cells by inserting the DNA sequence, as set forth ^{in claim 1} in Claims 1 to 4, or at least a fragment thereof, into those genes which are not naturally or not substantially inducible through ozone.~~

34. The use of the DNA sequence, as set forth in Claim 1, or a fragment thereof, for detecting ozone-responsive sequence ranges in genes of plants.

A 35. The use of the DNA-sequence, as set forth ^{in Claim 1} ~~in one of Claims 1 to 4~~, or a fragment thereof, to produce ozone-inducible characteristics in transgenic plants or plant cells.

A 36. The use of the DNA-sequence, ^{as set forth in Claim 1} ~~as set forth in one of Claims 1 to 4~~, or a fragment thereof, to ^{produce transgenic plants} ~~produce plants, according to Claim 18~~, which can be used as biomonitors for the quantitative and/or qualitative determination of ozone-concentrations.

A 37. The use of the promotor region, ^{as set forth in Claim 5} ~~as set forth in one of Claims 5 to 7~~, to produce greater pathogen-inducible but not ozone-inducible resistance to disease in transgenic plants.

add C₉ add D₃